

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/568,699 Confirmation No.: 7132
Applicant(s) : Nicolaas A. DE MUNCK *et al.*
File Date : September 29, 2006
TC/A.U. : 1796
Examiner : Liam J. HEINCER
Title : *"Improvements In Or Relating To Plasticizer"*
Atty. Docket No. : 2003M091
Customer No. : 23455 Date: July 8, 2010

Mail Stop Appeal Brief-Patents

Commissioner for Patents

P. O. Box 1450

Alexandria, VA 22313-1450

APPEAL BRIEF SUBMITTED UNDER 37 C.F.R. § 41.37

Responsive to the Final Rejection mailed December 8, 2009 as to the above-referenced application, and the Notice of Appeal filed on April 8, 2010, Appellants submit the following Appeal Brief along with the authorization to pay the requisite fee under 37 C.F.R. § 41.20(b)(2). Applicants submit concurrently herewith a Petition to Extend Time for a period of one month, from June 8, 2010, the date now set, up to and including July 8, 2010, along with the authorization for the requisite fee.

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I. Real Party in Interest

The above-referenced application is assigned ExxonMobil Chemical Patents Inc. (at reel/frame 017908/0043), a wholly owned affiliate of Exxon Mobil Corp.

II. Related Appeals and Interferences

No other appeals or interferences are known which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

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III. Status of Claims

Claims 10-12, 19, 23, and 26-28 are pending in the application, stand finally rejected, and are the subject matter of the appeal. Claims 1-9, 13-18, 20-22, 24-25, and 29-39 are cancelled.

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IV. Status of Amendments

No amendments have been filed subsequent to the final rejection of December 8, 2009.

V. Summary of Claimed Subject Matter

One independent claim remains, claim 10. It recites a process for the production of a plasticiser ester comprising:

- (i) esterifying an acid or an anhydride with an alcohol containing from 6 to 13 carbon atoms to form a crude ester; then
- (ii) treating the crude ester with a base to form a treated ester; then without a stripping step to remove excess alcohol prior to step (iii),
- (iii) filtering the treated ester to separate a liquid product; then
- (iv) stripping the liquid product to form a stripped material; then
- (v) treating the stripped material with activated carbon; and then
- (vi) filtering the product of step (v), in the presence of a filter aid, to remove the adsorbent from the plasticiser ester;

wherein the plasticizer ester comprises a di-alkyl phthalate selected from at least one of the group consisting of di-2-ethyl hexyl phthalate, di-isononyl phthalate, and di-isodecyl phthalate, characterised by a carbonyl number below 0.2 mg KOH/g, a light ends content of less than 1000 ppm wt, and a liquid volume resistivity (LVR) (in units of 10^{12} ohm.cm) that is:

- i) greater than about 0.3 in the case where di-alkyl is di-2-ethyl hexyl;
- ii) greater than about 0.6 in the case where di-alkyl is di-isononyl; and
- iii) greater than about 1.35 in the case where di-alkyl is di-isodecyl.

The claimed subject matter appears among other places at paragraphs [0040]-[0046], [0070]-[0089], Examples 1 & 2, and Tables 1-3, in the Specification of this application's publication, U.S. Patent Application Publication No. 2007/0105999.

VI. Grounds of Rejection to be Reviewed on Appeal

I. Whether Claims 10-12, 19, 23, and 26-28 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 4,543,420 to Godwin *et al.* in view of U.S. Patent No. 5,798,319 to Schlosberg *et al.*

II. Whether Claims 10-12, 19, 23, and 26-28 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,880,310 to Ageishi *et al.* in view of U.S. Patent No. 5,798,319 to Schlosberg *et al.*

VII. Argument

I. The Examiner erred in finally rejecting Claims 10-12, 19, 23, and 26-28 as being unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 4,543,420 to Godwin *et al.* (herein "Godwin") in view of U.S. Patent No. 5,798,319 to Schlosberg *et al.* (herein "Schlosberg"). The subject claims stand or fall together.

Appellants respectfully submit that the Office has erred in concluding that the pending claims are unpatentable in two obviousness rejections set forth below. In particular, "[t]he key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious." (M.P.E.P. § 2141.) Applicants respectfully submit that a clear, explicit articulation of why the pending claims are obvious has not been provided, especially considering the great and many differences between that of the claimed invention and prior art.

The substance of the rejections only represents a piecemeal of the picking and choosing of features from the prior art of record working off the hindsight of Appellants' Specification. Appellants respectfully submit that this is not the proper application of the obviousness standard articulated by the Supreme Court and that "rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (M.P.E.P. § 2141) (citation omitted). Indeed, the claimed invention goes beyond predictable results, simple substitutions, using known techniques to improve similar methods in the same way, and beyond a finite number of identified, predictable solutions of solving a problem, with a reasonable expectation of success.

In particular, the presently claimed invention is directed to a process for the production of a plasticiser ester comprising:

- (i) esterifying an acid or an anhydride with an alcohol containing from 6 to 13 carbon atoms to form a crude ester; then
- (ii) treating the crude ester with a base to form a treated ester; then without a stripping step to remove excess alcohol prior to step (iii),
- (iii) filtering the treated ester to separate a liquid product; then
- (iv) stripping the liquid product to form a stripped material; then

- (v) treating the stripped material with activated carbon; and then
- (vi) filtering the product of step (v), in the presence of a filter aid, to remove the adsorbent from the plasticiser ester;

wherein the plasticizer ester comprises a di-alkyl phthalate selected from at least one of the group consisting of di-2-ethyl hexyl phthalate, di-isononyl phthalate, and di-isodecyl phthalate, characterised by a carbonyl number below 0.2 mg KOH/g, a light ends content of less than 1000 ppm wt, and a liquid volume resistivity (LVR) (in units of 10^{12} ohm.cm) that is:

- i) greater than about 0.3 in the case where di-alkyl is di-2-ethyl hexyl;
- ii) greater than about 0.6 in the case where di-alkyl is di-isononyl; and
- iii) greater than about 1.35 in the case where di-alkyl is di-isodecyl. As a result, improvements in electrical properties and/or odour reduction may be obtained in end-use articles utilizing the plasticiser esters of the subject claims. For a detailed explanation of the importance of these attributes in applications such as, for example, wire and cable insulation and other electrical insulating materials, see paragraphs [0004]-[0010] and [0015] in the Specification of this application's publication, U.S. Patent Application Publication No. 2007/0105999.

In contrast, Godwin suggests that pyromellitate plasticizers are provided by the following steps:

- (i) pyromellitic dianhydride or pyromellitic acid is esterified with an isononyl or isodecyl alcohol;
- (ii) preferably purifying by base wash followed by water wash until neutral;
- (iii) stripping [excess alcohol] with heat and under vacuum with or without charcoal;
- (iv) treatment with activated alumina, attapulugus clay, or celite, molecular distillation and the like. Thus, Godwin fails to suggest filtering the mixture (step (iii) of the present claims), prior to stripping of excess alcohol (step (iv)).

Schlosberg does not cure the deficiencies of Godwin. In particular, Schlosberg does not, in fact, teach or suggest avoidance of stripping prior to filtering. Rather, as set forth in detail in column 5 of Schlosberg, the reference discloses:

- (i) esterification;
- (ii) addition of absorbents;
- (iii) addition of base;

(iv) removal of water by "heat" and "vacuum in a flash step" (e.g., stripping);
(v) filtration of solids from "the bulk of excess alcohol";
(vi) removal of excess alcohol by stripping;
(vii) removal of residual solids by filtration. (emphasis added). Thus, Schlosberg does not avoid a stripping step before filtration. Step (iv) heats the product, along with water, and alcohol, in the presence of solids and base. Indeed, Schlosberg does not fairly teach or suggest to an artisan filtering the base-treated solution prior to a stripping step. Even if one were to pick and choose from amongst the references as best one could, one could still not arrive at the presently claimed invention. As such, Appellants respectfully submit that a *prima facie* case of obviousness has not been established.

However, for the sake of argument, even if such a case had been established, the pending claims were restricted to di-alkyl phthalate esters and are directed to the unexpected results achieved by use of activated carbon (as the absorbent) in combination with the step of filtering prior to stripping of excess alcohol. Neither Godwin taken alone or in combination with Schlosberg teach or suggest the use of activated carbon and filtering prior to the stripping of excess alcohol. This combination and sequence of steps achieves the unexpected results demonstrated in the examples in Specification. Appellants respectfully submit that such a showing is more than adequate to rebut any *prima facie* case of obviousness.

Additionally, the pending claims were also amended to recite *wherein the plasticizer ester comprises a di-alkyl phthalate selected from at least one of the group consisting of di-2-ethyl hexyl phthalate, di-isononyl phthalate, and di-isodecyl phthalate, characterised by a carbonyl number below 0.2 mg KOH/g, a light ends content of less than 1000 ppm wt, and a liquid volume resistivity (LVR) (in units of 10¹² ohm.cm) that is: i) greater than about 0.3 in the case where di-alkyl is di-2-ethyl hexyl; ii) greater than about 0.6 in the case where di-alkyl is di-isononyl; and iii) greater than about 1.35 in the case where di-alkyl is di-isodecyl*. This recitation is directed to important attributes of the end-use article such as electrical properties and reduction in odour. The references either alone or in combination fail to appreciate the problems associated with perfecting such attributes moreless offer any solution to improving these attributes. As such, withdrawal of the rejection is respectfully requested.

II. The Examiner erred in finally rejecting Claims 10-12, 19, 23, and 26-28 as being unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,880,310 to Ageishi *et al.* (herein "Ageishi") in view of Schlosberg. The subject claims stand or fall together.

Ageishi does not teach or suggest obtaining a high purity product because, among other reasons, stripping with steam in the presence of alkali can cause hydrolysis of the ester, which would be expected to increase light ends as discussed in the Specification at paragraph [0011] of this application's publication, U.S. Patent Application Publication No. 2007/0105999. In particular, Ageishi teaches the following steps:

- (i) deoxidized alcohol is esterified with an organic acid;
- (ii) alkaline solution is added to neutralize excess acid;
- (iii) carbon dioxide gas is added to neutralize excess alkali;
- (iv) excess alcohol is recovered (by stripping);
- (v) a purified product is obtained by filtering through filter aid.

Thus, Ageishi does not teach or suggest filtering the mixture prior to stripping excess alcohol. It has been proposed by the Office during prosecution that it would have been obvious from Schlosberg to filter the solids from the ester mixture and then remove excess alcohol by stripping. Appellants respectfully disagree. Schlosberg is concerned with oxidative stability in a composition to be used as a lubricant. In contrast, the pending claims are concerned with materials for insulation such as in wire and cable insulation. Additionally, even if an ordinary artisan were to look to Schlosberg for alternative steps, it is clear that the secondary reference does not, in fact, teach avoidance of stripping prior to filtering. Rather, as set forth in detail in column 5 of Schlosberg as stated above, the reference teaches:

- (i) esterification;
- (ii) addition of absorbents;
- (iii) addition of base;
- (iv) removal of water by "heat" and "in a vacuum flash step" (e.g., stripping)
- (v) filtration of solids from "the bulk of excess alcohol";
- (vi) removal of excess alcohol by stripping;
- (vii) removal of residual solids by filtration. (emphasis added).

Thus, Schlosberg does not avoid a stripping step before filtration. Step (iv) heats the product, along with water and alcohol, in the presence of solids and base. As taught in the Specification, such a step of stripping in the presence of basic material (alkali) and solids would

be expected to lead to increase in light ends in the final product that is detrimental to the properties of the end-use application. Furthermore, a skilled artisan would interpret the use of "bulk" in Schlosberg to mean that some alcohol is removed before step (v), i.e., in step (iv). As such, Appellants respectfully submit that a *prima facie* case of obviousness has not been established.

However, for the sake of argument, even if such a case had been established, the pending claims were restricted to di-alkyl phthalate esters and are directed to the unexpected results achieved by use of activated carbon (as the absorbent) in combination with the step of filtering prior to stripping of excess alcohol. Neither Ageishi taken alone or in combination with Schlosberg teach or suggest the use of activated carbon and filtering prior to the stripping of excess alcohol. This combination and sequence of steps achieves the unexpected results demonstrated in the examples in Specification. Appellants respectfully submit that such a showing is more than adequate to rebut any *prima facie* case of obviousness.

Additionally, the pending claims were also amended to recite *wherein the plasticizer ester comprises a di-alkyl phthalate selected from at least one of the group consisting of di-2-ethyl hexyl phthalate, di-isononyl phthalate, and di-isodecyl phthalate, characterised by a carbonyl number below 0.2 mg KOH/g, a light ends content of less than 1000 ppm wt, and a liquid volume resistivity (LVR) (in units of 10¹² ohm.cm) that is: i) greater than about 0.3 in the case where di-alkyl is di-2-ethyl hexyl; ii) greater than about 0.6 in the case where di-alkyl is di-isononyl; and iii) greater than about 1.35 in the case where di-alkyl is di-isodecyl*. This recitation is directed to important attributes of the end-use article such as electrical properties and reduction in odour. The references either alone or in combination fail to appreciate the problems associated with perfecting such attributes moreless offer any solution to improving these attributes. As such, withdrawal of the rejection is respectfully requested.

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The Board of Appeals is respectfully requested to reverse the finality of the office action and remand this application to the Examiner with an instruction to allow the pending claims.

Respectfully submitted,

July 8, 2010

Date

/Leandro Arechederra,III/

Leandro Arechederra, III
Attorney for Appellants
Registration No. 52,457

Post Office Address (to which all correspondence should be sent):
ExxonMobil Chemical Co.
Law Technology
P.O. Box 2149
Baytown, Texas 77522-2149
Phone: 281-834-0599
Fax: 281-834-2495

VIII. Claims Appendix

Listing of Claims:

1-9. (Cancelled)

10. (Previously Presented) A process for the production of a plasticiser ester comprising:

- (i) esterifying an acid or an anhydride with an alcohol containing from 6 to 13 carbon atoms to form a crude ester; then
- (ii) treating the crude ester with a base to form a treated ester; then without a stripping step to remove excess alcohol prior to step (iii),
- (iii) filtering the treated ester to separate a liquid product; then
- (iv) stripping the liquid product to form a stripped material; then
- (v) treating the stripped material with activated carbon; and then
- (vi) filtering the product of step (v), in the presence of a filter aid, to remove the adsorbent from the plasticiser ester;

wherein the plasticizer ester comprises a di-alkyl phthalate selected from at least one of the group consisting of di-2-ethyl hexyl phthalate, di-isononyl phthalate, and di-isodecyl phthalate, characterised by a carbonyl number below 0.2 mg KOH/g, a light ends content of less than 1000 ppm wt, and a liquid volume resistivity (LVR) (in units of 10^{12} ohm.cm) that is:

- i) greater than about 0.3 in the case where di-alkyl is di-2-ethyl hexyl;
- ii) greater than about 0.6 in the case where di-alkyl is di-isononyl; and
- iii) greater than about 1.35 in the case where di-alkyl is di-isodecyl.

11. (Original) The process according to claim 10 wherein the base is an alkali metal salt.

12. (Original) The process according to claim 10 wherein the base is selected from the group consisting of sodium hydroxide and sodium carbonate.

13 - 18. (Cancelled)

19. (Original) The process according to claim 10 wherein the combined amount of adsorbent and the filter aid employed is from about 0.01 to about 5 wt%, based on the weight of the plasticiser ester.
- 20 - 22. (Cancelled)
23. (Original) The process according to claim 10 wherein the filter aid is a clay.
- 24 - 25. (Cancelled)
26. (Original) The process according to claim 10 wherein the treatment step (v) is performed at a temperature in the range of about 20 to about 180°C.
27. (Original) The process according to claim 10 wherein the treatment step (v) is performed at a temperature in the range of about 80 to about 120°C.
28. (Original) The process according to claim 10 wherein the treatment step (v) is performed at a temperature in the range of about 80 to about 120°C and in which the plasticizer ester is a C₈ to C₁₃ dialkyl phthalate.
- 29 - 39. (Cancelled)

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IX. Evidence Appendix

NONE.

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X. Related Proceedings Appendix

NONE.